

**CLAIMS**

1. Metallic pigments with a coating,  
characterized in that

5 the coating envelops the metallic pigments and comprises an oligomeric and/or  
polymeric binding agent which is chemically cross-linkable and/or cross-linkable  
under the action of heat, infrared radiation, ultraviolet radiation and/or electron  
radiation, which coated metallic pigments are present in the form of a powder which  
has a particle size  $d_{50}$  of less than 190  $\mu\text{m}$  and are resistant to corrosion following  
10 curing in a powder-based varnish.

2. Metallic pigments as defined in claim 1,  
characterized in that  
the particle size  $d_{50}$  of the coated metallic pigments ranges from 5  $\mu\text{m}$  to 100  $\mu\text{m}$ .

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3. Metallic pigments as defined in any one of the previous claims,  
characterized in that  
said metallic pigments contain from 20 to 85 % by weight of oligomeric and/or  
polymeric binding agent, based on the total weight of the coated metallic pigments.

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4. Metallic pigments as defined in any one of the previous claims,  
characterized in that  
the coating contains, in addition to said binding agent, further additives and/or  
auxiliaries.

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5. Metallic pigments as defined in claim 4,  
characterized in that  
the additives and/or auxiliaries comprise organic and/or inorganic colored pigments  
and/or dyes.

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6. Metallic pigments as defined in claim 4,  
characterized in that  
the additives and/or auxiliaries comprise curing agents, photoinitiators and/or  
polymerization initiators.

7. Metallic pigments as defined in claim 4,  
characterized in that

the additives and/or auxiliaries comprise further varnish components, preferably  
5 fillers, degassing agents, film-forming auxiliaries, flameproofing agents, adhesion  
promoters, light-stabilizing agents, flattening agents, polymerization initiators, radical  
interceptors, anticaking agents, slip agents, radiation-hardening reactive diluents,  
ultraviolet absorbers, flow-control agents, cross-linking catalysts, and/or waxes.

10 8. Metallic pigments as defined in any one of the previous claims,  
characterized in that

the metallic pigments are primed, prior to application of said coating with binding  
agent, with an additional, preferably cross-linked layer or with a plurality of additional,  
preferably cross-linked layers.

15 9. Metallic pigments as defined in claim 8,  
characterized in that

the metallic pigments are primed with silicon dioxide, metal oxide, organophosphoric  
compounds, preferably phosphates and/or phosphonic acid compounds, and/or  
20 polymers.

10. Metallic pigments as defined in claim 8,  
characterized in that

the metallic pigments are primed with adhesion promoters for the binding agent  
25 coating, preferably functionalized silanes, functionalized polymers and/or  
organophosphorus compounds, preferably phosphate esters and/or phosphonic acid  
compounds .

11. Metallic pigments as defined in any one of the previous claims,  
30 characterized in that

the binding agent(s) is/are selected from the group consisting of polyester resins,  
epoxide resins, polyurethane resins, UV-curing systems, acrylates, and mixtures  
thereof.

12. Metallic pigments as defined in claim 11,  
characterized in that

the polyester resins are selected from the group consisting of saturated polyester resins containing OH groups and having a hydroxyl number between 30-150 mg of  
5 KOH/g, saturated carboxyl group-containing polyester resins having an acid value between 25 - 70 mg of KOH/g, and mixtures thereof.

13. Metallic pigments as defined in claim 11,  
characterized in that

10 the epoxide resins are selected from the group consisting of more than one epoxide ring and preferably having an epoxy equivalent weight (EEW) of from 400 to 2500.

14. Metallic pigments as defined in claim 11,  
characterized in that

15 the polyurethane resins are selected from the group consisting of OH-functional polyester resins or polyacrylate resins with blocked and/or unblocked polyisocyanates, and mixtures thereof.

15. Metallic pigments as defined in claim 11,  
20 characterized in that

the UV-curing systems are compounds having mono-unsaturated and/or polyunsaturated double bonds.

16. Metallic pigments as defined in any one of claims 6 to 15,  
25 characterized in that

the curing agent is selected from the group consisting of hydroxyalkylamine-containing compounds, glycidyl group-containing compounds, epoxy group-containing compounds, triglycidyl isocyanurates, and mixtures thereof.

30 17. Metallic pigments as defined in any one of the previous claims,  
characterized in that

cross-linking of the binding agent(s) and of any curing agent present is thermally inducible.

18. Metallic pigments as defined in any one of the previous claims,  
characterized in that  
the coating containing binding agent contains corrosion inhibitors.

5 19. Metallic pigments as defined in claim 18,  
characterized in that  
the corrosion inhibitors are anodic and/or cathodic corrosion inhibitors.

10 20. Metallic pigments as defined in claim 18 or claim 19,  
characterized in that  
the corrosion inhibitors are corrosion-stabilizing pigments, preferably selected from  
the group consisting of strontium zinc phosphosilicate, zinc aluminum polyphosphate  
hydrate, zinc calcium aluminum strontium phosphatesilicate hydrate, zinc calcium  
15 strontium orthophosphatesilicate hydrate, strontium aluminum polyphosphate  
hydrate, calcium aluminum polyphosphatesilicate hydrate, and sodium and/or  
calcium and/or zinc molybdate and/or phosphomolybdate and/or zinc phosphate  
complex, and mixtures thereof.

20 21. Metallic pigments as defined in any one of claims 18 to 20,  
characterized in that  
the corrosion-stabilizing pigments have a mean particle size ranging from 0.1 to  
10  $\mu\text{m}$  and preferably from 0.15 to 5  $\mu\text{m}$ .

25 22. Metallic pigments as defined in any one of claims 1 to 21,  
characterized in that  
the metallic pigments are selected from the group consisting of aluminum, copper,  
iron, titanium, nickel, zinc, and brass pigments, and mixtures thereof.

30 23. Metallic pigments as defined in any one of claims 1 to 22,  
characterized in that  
the metallic pigments are oxidized metallic pigments and preferably oxidized copper  
and/or brass pigments.

24. Metallic pigments as defined in any one of claims 1 to 22,

characterized in that  
the metallic pigments are chemically wet-process oxidized aluminum pigments.

25. Metallic pigments as defined in any one of the previous claims,  
5 characterized in that  
the metallic pigments are metal-containing interference pigments having a metal core  
and/or a metal coating.

26. Metallic pigments as defined in any one of the previous claims,  
10 characterized in that  
the powder exists as a paste in conjunction with a liquid phase, preferably an organic  
solvent .

27. A masterbatch for powder-based varnishes,  
15 characterized in that  
the masterbatch contains metallic pigments as defined in any one of claims 1 to 25.

28. A coating composition,  
characterized in that  
20 the coating composition contains metallic pigments as defined in any one of claims 1  
to 26, which metallic pigments are resistant to corrosion following curing of the  
coating composition.

29. A coating composition as defined in claim 28,  
25 characterized in that  
the coating composition contains a powder-based varnish.

30. A coating composition as defined in claim 28 or claim 29,  
characterized in that  
30 the coating composition has a metal content of from 0.5 % to 15 % by weight and  
preferably from 1 % to 12 % by weight, based on the total weight of the coating  
composition.

31. A coating composition as defined in claim 30,

characterized in that

the coating composition has a metal content of from 2 % to 8 % by weight.

32. A coating composition as defined in any one of claims 29 to 31,

5 characterized in that

the powder-based varnish and the coating of the metallic pigments contain the same binding agent.

33. A coated object,

10 characterized in that

the object is coated with metallic pigments as defined in any one of claims 1 to 26 or with a coating composition as defined in any one of claims 28 to 32.

34. A coated object ,

15 characterized in that

the object is a facade element, preferably a facade tile, a window frame, a vehicle body, preferably a body of a motor vehicle, or a frame of a vehicle, preferably a bicycle or motorcycle.

20 35. A process for the production of a metallic pigment as defined in any one of claims 1 to 26, comprising the steps:

a) preparing a solution or dispersion of an oligomeric and/or polymeric binding agent in an organic solvent,

25 b) coating the metallic pigment with said binding agent by

i) dispersing the metallic pigment in the solution or dispersion produced in step a) followed by atomization thereof or

ii) atomizing the solution or dispersion produced in step a) onto metallic pigments fluidized in a gas stream,

30 c) drying the metallic pigments coated with binding agent in a turbulent gas stream.

36. A process for the production of a metallic pigment as defined in claim 35, characterized in that the metallic pigments coated with binding agent are, following step c), additionally subjected to size classification.

5 37. A process as defined in claim 35 or claim 36, characterized in that further additives and/or auxiliaries are added to the oligomeric and/or polymeric binding agent dissolved or dispersed in solvent, preferably prior to contact thereof with the metallic pigments .

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38. The process as defined in claim 37, characterized in that the additives and/or auxiliaries comprise curing agents, photoinitiators and/or polymerization initiators.

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39. The process as defined in claim 37, characterized in that the additives and/or auxiliaries comprise corrosion inhibitors and preferably corrosion-stabilizing pigments .

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40. The process as defined in any one of claims 35 to 39, characterized in that the solvent used is water, an organic solvent, or a water-containing organic solvent.

25 41. The process as defined in any one of claims 35 to 40, characterized in that the steps (bi) and (c) are combined in that atomization of the coated metallic pigments and the elimination of the solvent are carried out by spray drying.

30 42. The process as defined in any one of claims 35 to 40, characterized in that the steps (bii) and (c) are combined in that the coating and drying of the metallic pigments is carried out in a fluid bed or a fluidized bed in that the oligomeric and/or

polymeric binding agent dissolved or dispersed in the solvent is spray injected and the solvent is removed by turbulent mixing in the fluid bed or the fluidized bed.

43. The use of the metallic pigment as defined in any one of claims 1 to 25 in  
5 paints, varnishes, powder-based varnishes, printing inks, plastics materials, or nail  
varnish.

44. The use of the metallic pigment as defined in any one of claims 1 to 25 in  
highly durable powder-based varnishes for coating facades.

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45. A nail varnish, characterized in that  
it contains metallic pigments as defined in any one of claims 1 to 26.



### Summary

The invention relates to coated metallic pigments wherein the coating envelops the metallic pigments and comprises one or more than one cross-linkable oligomeric and/or polymeric bonding agent that can be cross-linked chemically and/or by heat, IR radiation, UV radiation, and/or electron radiation, wherein the coated metallic pigments are present as a powder having a mean particle size  $d_{50}$  of less than 190  $\mu\text{m}$ , and are corrosion stable in a powder-based varnish after they have been cured. The invention further relates to a coating composition, to a process for the production of said coated metallic pigments and to the use thereof.